Looking at the results of the four expeditions, we are struck with the careful way in which all operations have been conducted, especially towards the end of the period. The mounds were carefully surveyed, and even a relief map of them was made in plaster, the buildings which were discovered were accurately mapped, numerous photographs were taken of the various phases of the diggings, and as time went on those in command became even more methodical in their diggings. The manner in which the excavations were carried on merits the highest praise.

The "section" of the shafts dug through the mounds, as figured by Prof. Hilprecht in his latest work, "Explorations in Bible Lands" (p. 549), shows, as is common in ancient mounds, that the city was occupied from a very early period, and that from time to time new builders superimposed their pavements and dwellings upon those of an earlier period, so that the mounds are made up of successive layers, each marking an earlier building as the shafts sink lower. The diggers first cut through soil containing Sassanian and early Arabic remains. Then came the great Parthian fortress of the second or third century B.C. Next were found in six successive strata the pavements of buildings of (*a*) Ashurbanipal, who restored the great *ziggurat*, or temple-tower (*c.* 668-626 B.C.); (*b*) Kadashman-turgu (*c.* 1350 B.C.); (*c*) Ur-ninib (*c.* 2500 B.C.); (*d*) Ur-gur (*c.* 2700 B.C.); (*e*) Lugal-surzu (*c.* 3500 B.C.); (*f*) Sargon and Naram-Sin (*c.* 3750 B.C.). Below these, and beneath the level of the surrounding plain, a vaulted drain came to light, of a period distinctly before Sargon, and in the heart of the mound, on a slightly higher level, was a pre-Sargonic *ziggurat*. Straight down through these layers, from almost the top to the very water-level, a Parthian well had been sunk, a total distance of about seventy feet in depth. The mound of Nippur is therefore similar to Hissarlik and Tel-el-Hesy in the superimposition of cities.

The larger of the two Parthian buildings was a palace and fortress occupying what had been the centre part of the old Babylonian temple, and was an almost rectangular building surrounded by an enormous double wall, five hundred and sixty feet long on its south-eastern front. From the discovery of great masses of water-jars piled together in the southern part, as well as various fire-places and other kitchen arrangements close to them, it is clear that these were the servants' quarters, storehouses and bakeries. In the centre of the whole building rose the citadel, built over the ancient *ziggurat*, and it was through this that the only well of the whole building had been dug, evidently with the idea of the garrison holding out against a long protracted siege.

The smaller Parthian palace, west of the Chebar, which has been completely excavated, was a square building, measuring each side about 170 feet. It apparently had but one entrance, which was situated in the centre of the north-west façade. The walls varied in thickness from three to eight and a half feet, and the material used in the construction was brick, baked and unbaked. The roof, as the pieces of charred wood discovered in the ruins plainly show, was of palm logs, matting and earth. Prof. Hilprecht divides the building into two almost equal parts, the one for public functions and the other for the family life.

But important as these two buildings were, their interest cannot compare with the discoveries of earlier Babylonian ruins. Of these the huge *ziggurat*, or tower of the Temple of Bel, stands out pre-eminent, a huge brick building, the origin of which dates back to pre-Sargonic times, and shows in its various strata traces of the handiwork of the many kings who restored and added to it. According to Prof. Hilprecht, the Temple o Bel (called Ekur in the cuneiform inscriptions) was divided into two principal buildings, the *ziggurat* or great tower, and the "House of Bel." The whole was surrounded by the great wall called *Imgur-Marduk*. It is to this temple that the energies of the excavators have been principally directed, and from it have come the majority of the tablets found. The temple in Babylonia was not only a place wherein the gods might be worshipped, but was also a college at which priests were trained, and for this a reference library was essential. Consequently, it is not going too far to say that probably every important temple in Assyria and Babylonia had its own library of clay tablets. An excellent idea of what the temple rooms looked like may be gained from the photograph in Prof. Hilprecht's book, "Explorations in Bible Lands," p. 509.

In the remains of this Babylonian city many discoveries were made which add considerably to our knowledge of the daily life of the inhabitants. One of the most remarkable things found was a baking furnace made of brick, dating back to the third millennium B.C., composed of a series of seven (originally nine) parallel arches over a fire-box which ran lengthwise through the whole kiln. It was, in fact, very similar to the military field-ovens in use at the present day. Still earlier is the specimen of the elliptical arch which Haynes discovered, which Prof. Hilprecht assigns to the fifth millennium B.C. This is undoubtedly the first Babylonian arch known, and will go far to prove the much-disputed question of the origin of the arch.

Up to the present comparatively few of the tablets discovered in the ruins have been published, so that it is impossible to speak of the possibilities of the great temple library. We may notice, however, an important clay map of Nippur, photographed in Prof. Hilprecht's book (p. 518), which gives the environments of that ancient city as they were about two thousand five hundred years ago. Interesting, also, are the "practice" tablets, written by the pupils in the schools during their study of the Babylonian language. Indeed, it is to this class of tablet that we owe much of our knowledge of the classical works in cuneiform, for many similar are preserved in the British Museum which are inscribed with excerpts from the Creation legends, syllabaries, and incantations.

Much remains to be done at Nippur, and it is to be hoped that the Americans will continue and complete the great work they have begun. There is little doubt that when the mounds of Assyria and Babylonia have yielded up their hoards of cuneiform tablets stored up in the palace and temple libraries, our knowledge of those countries will equal, if not surpass, what we know of the archæology of Greece and Rome.

MATHEMATICAL REFORM AT CAMBRIDGE.

THE syndicate appointed in December, 1902, to consider what changes, if any, should be made in the regulations affecting the mathematical portions of the pass examinations of the University of Cambridge has recently presented a report which has just been adopted by the Senate, and will profoundly and beneficially affect the teaching of the subject in our public schools and throughout the country.

Recognising the widespread desire for reform, noting the changes that have already been made in the schedules of important examining bodies, and having examined the recommendations of various committees, the syndicate is convinced that changes are desirable, and that a "modification of the requirements of

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examinations is a necessary preliminary to any substantial improvement in teaching."

The syndicate has, therefore, made recommendations affecting the subject-matter of the Previous Examination. The alterations will begin to operate in the Lent term of 1904, and will finally supersede the present regulations after October, 1905. The principal changes may be summarised as follows :—

(1) In demonstrative geometry, Euclid's Elements shall be optional as a text-book, and the sequence of Euclid shall not be enforced. The examiners will accept any proof of a proposition which they are satisfied forms part of a systematic treatment of the subject.

(2) Practical geometry is to be introduced, along with deductive geometry, and questions will be set requiring careful draughtsmanship and the use of efficient drawing instruments.

(3) In arithmetic, the use of algebraical symbols and processes will be permitted.

(4) In algebra, graphs and squared paper work will be introduced; and a knowledge will be required of fractional indices and the use of four figure tables of logarithms.

The scope of the subject-matter in geometry is set out in two schedules. The first gives a list of constructions in practical geometry. We venture to take exception to one detail in this list, that of requiring a construction for drawing a common tangent to two circles. Why insist on first finding the points of contact? This may have been necessary under Euclid's postulates, but it should now be discarded; it is not practical geometry.

The second schedule indicates the amount of book work necessary in preparing for the Previous Examination. The propositions enumerated are nearly all contained in the Elements, but a judicious amount of pruning has been effected in the latter. Hypothetical constructions are permitted. The theory of incommensurables is not required.

The increase of freedom now being given to teachers should lead to further developments in the reform as experience is gained. It will be one great advantage to have the several branches of the subject brought into closer association and reacting on one another.

Geometry will be made generally interesting and will at last have a chance of being taught in a manner suited to boys. In looking out for suitable numerical examples in geometry, we predict that a good teacher will not fail to make use of functions of angles. Probably three figure tables of chords, sines, cosines and tangents will be sufficient, reading to tenths of a degree, and occupying a very modest space. A boy's interest will be stimulated when he discovers the latent power residing in these innocent looking tables. And in checking his graphical results, he may be led on to the numerical solution of right-angled triangles before he has heard of trigonometry, and will never afterwards be repelled by the symbols sin., cos., tan.

The employment of logarithms is most important. Their use illustrates the significance of fractional indices. And here again the interest of a boy must surely be aroused when he finds himself in possession of a new, unforeseen, and most valuable means of calculation.

The introduction of graphs is of great value. The fundamental idea of the representation of position and change of position by means of rectangular coordinates is thus acquired early and in an agreeable manner. Some teachers find that it is quite possible to go on without much delay to easy illustrations of the calculus.

Looking ahead to possible developments, the graphical use of polar coordinates to mark position and change of position, by the plotting of lengths and angles, might serve as an introduction to the study of vectors, a subject of first importance, and at present so woefully neglected.

We regard this reform at Cambridge as an important step in the movement now in progress throughout the country, and we hope to see it carried much farther before crystallisation takes place.

THE UNIVERSITY OF LONDON.

THE presentation for degrees of the University of London, which is to take place in the Albert Hall as we go to press, under the presidency of the Chancellor, Lord Rosebery, is noteworthy in several respects. For the first time in the history of the university, honorary degrees are to be conferred, the recipients being their Royal Highnesses the Prince and Princess of Wales, Lord Kelvin, and Lord Lister. The Prince is to receive the honorary degree of Doctor of Laws, the Princess that of Doctor of Music, and Lord Kelvin and Lord Lister that of Doctor of Science. Ordinary degrees are also to be conferred on 414 persons who have obtained them during the past year. Moreover, the occasion is remarkable as being the first gathering of representatives of all the different institutions and groups of persons connected with the university.

The reconstituted university has opened up new avenues of work in connection with schools, with university extension, with the colleges, medical schools, and polytechnics; students are entering both for the ordinary matriculation examination and for post-graduate study and research in unexpected numbers. The educational forces of London have, in fact, been organised by the university, and public interest is being shown in the work. But, as Sir Arthur Rücker, the principal, has pointed out, while there are many grounds for hope, and while the university is doing its best to make itself worthy of public support, it can never fulfil its duties without the supply of funds from public or private sources on a very large scale. We trust that one result of the brilliant ceremony on Wednesday evening will be an increase of the endowment of the university sufficient to secure the full development of the scheme which has already produced such satisfactory results.

NOTES.

FOR the first time for about forty years the Royal Society of Edinburgh, on the evening of June 6, held a conversazione. Lord and Lady Kelvin and Sir William Turner received the guests. There were many interesting exhibits from several departments of the Universities of Edinburgh, Glasgow, and St. Andrews, from the Geological Survey of Scotland, the Scottish Antarctic Expedition, &c. Prof. McIntosh, of St. Andrews, sent over a large collection of pearl shells and animals, living and dead, and great interest was taken in Prof. Ewart's exhibition of hybrid ponies. Some of the lantern exhibits were particularly attractive, notably the projection on the screen of tanks of living worms, crustacea, &c., and a fine selection of slides made from Piazzi Smyth's "cloud" negatives. Among the inventions and novelties exhibited, Dr. Halm's instruments for mechanically correcting stellar observations and for solving Kepler's problem in any given case, and Dr. Hugh Marshall's petrol incandescence lamp are worthy of mention.

CAPTAIN AMMUNDSEN's Magnetic North Pole Expedition left Christiania on June 16 on board the ship *Gjoa.*

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